

DESCRIPTION

The **TS102Si** Thermo-electric (Peltier) based stage is specifically designed for inverted optical microscopes and is particularly ideal for applications such as cell culture and biology. The TS102Si can accommodate both Petri dishes and microscope slides with its optional cover lids. Dual TEC modules heat and cool the sample area without the need for cryogenics such as LN₂, making it especially convenient for performing long-duration experiments and ultimately reducing operating costs. Great optical access on both sides of the sample enables Inverted or upright microscopy with short working distances.



KEY FEATURES

Dual TEC Heating and Cooling Modules

Thermoelectric (Peltier) heating and cooling modules regulate sample temperature with good uniformity while maintaining optical access.

Active Cooling Without Cryogenics

TEC heating and cooling provide exceptional temperature stability and range without the need for consumable coolant. Heat up to 120°C and cool down to -30°C with our standard C100W benchtop water circulator, or -40°C with an upgraded [CW5000 Chiller](#).

Cover Lid Options

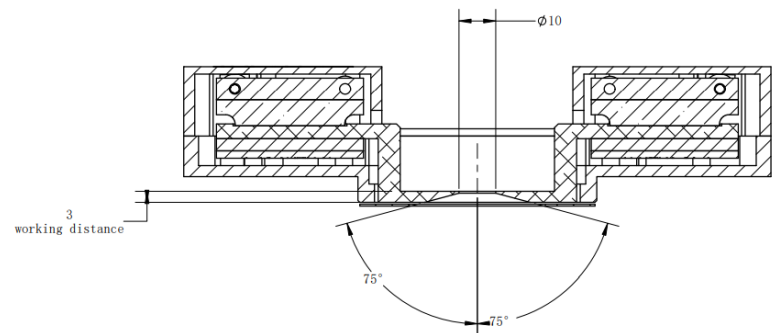
Optional sample cover options to accommodate standard 25mm x 75mm microscope slides, Ø35mm Petri dishes, or specialized flow cells. See the Options section below for more details.

Accuracy and Stability

A pt100 platinum RTD sensor is embedded into the thermal block to guarantee high-temperature accuracy and stability. The RTD sensor is calibrated to measure the temperature of the surface of the sample area – giving the closest and most accurate reading the sample temperature possible. Additional sensor options and alternative sensor types, such as a thermistors, are available upon request

Additional Features

- Includes standalone mK2000 temperature controller
- Includes 'InstecApp' Windows compatible software for optional operation via PC
- Comes standard with optical glass windows that can be easily replaced with IR or UV transparent glass.



THERMAL SPECIFICATIONS

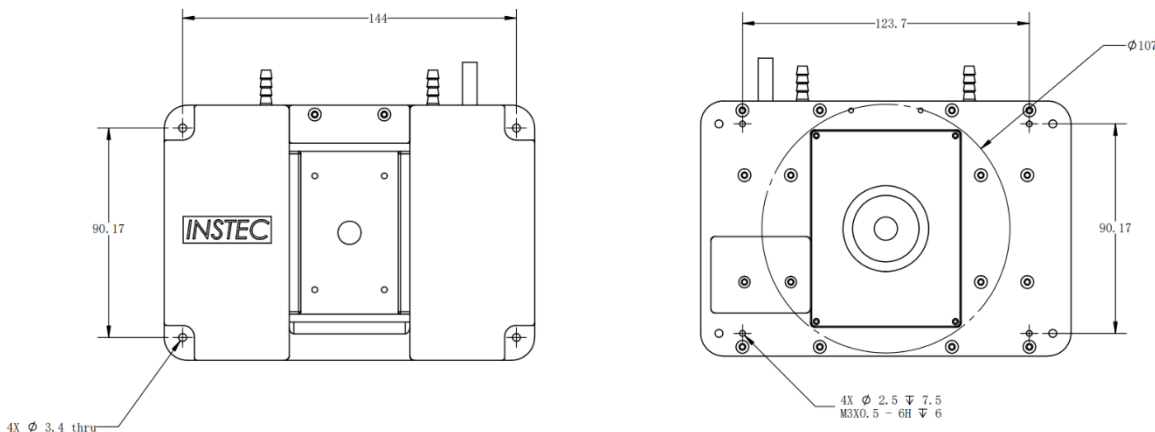
Temperature Control	<i>mK2000</i> with bidirectional LVDC output
Thermal Block	Clear anodized aluminum
Sample Thermal Cover	Optional removable inner sample cover with additional window (See options below)
Temperature Minimum	-10°C with standard C100W water circulator -30°C with C100W water circulator + Ice in the reservoir -40°C with optional upgraded chiller
Temperature Maximum	90°C standard (optional upgrade for 120°C)
Temperature Sensor	100 Ω Platinum RTD
Maximum Heating Rate	+15°C per minute at 37°C
Maximum Cooling Rate	-5°C per minute at 37°C
Minimum Heating and Cooling Rate	±0.01°C per minute
Temperature Resolution	0.01°C
Temperature Stability	±0.05°C
Power supply	Universal power input – 150W max (Not including water-cooling accessories)
Software	Windows software to record and export temperature-time data

OPTICAL SPECIFICATIONS

Optical access	Reflection and Transmission capability
Optical windows	Removable and exchangeable windows permit full-spectrum transparency
Minimum Objective Working Distance	3mm
*Optional Sample Cover Aperture	Ø10mm aperture (Ø12mm x Ø0.2mm glass)
Transmission Aperture	Ø10mm (option to reduce aperture to Ø 5mm for better uniformity)
Bottom Viewing Angle	±75° from normal

STRUCTURAL SPECIFICATIONS

Sample Area	Ø35mm to accommodate petri dishes, or 24mm x 75mm for microscope slides
Frame Cooling	Integrated TEC cooling with included C100W water-cooler. Optional chiller upgrade is available to increase lower temperature range
Mounting	Base model includes tapped holes on frame and removable side-mounted L-brackets. Horizontal mounting adaptors for specific instruments are available by request
Frame Dimensions	160mm x 110mm x 38mm
Weight	870g



OPTIONS



Temperature Limit Upgrades

Achieve lower minimum temperature with an upgraded water-cooler. The CW5000 has an internal refrigeration unit which cools down to 5°C, lowering the minimum temperature reachable by TEC systems. Chiller upgrade also requires FVC11 valve box for flow control. Achieve a higher maximum temperature with the separate 120°C upgrade.



Microscope

Entry-level polarizing microscope offering superior performance for a variety of research applications with specifications to satisfy a wide range of demanding observational requirements. (see [TPM-CX40](#))



Microscope Camera with Temperature Overlay

Integrate digital image acquisition with sample temperature overlay. Includes software (WinDV2 via InstecApp), USB 3.0 connection, 20-megapixel resolution, and standard C-mount microscope connection. (see [MITO2](#))



Mounting Adapter

Various mounting adapters are available for most microscope models and/or instruments. Custom mounting adapters may also be made to fit each and every application.

Inner Cover

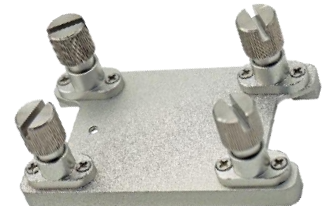
Optional sample covers are available to improve temperature uniformity for a range of samples. These include:



-LS/LSR; for 25mm x 75mm microscope slide samples. LS version has transmission aperture.






-LP/LPR; for Ø35mm Petri Dish samples. LS version has transmission aperture.



-LF/LFR; Cover with dual feedthroughs for flow-cell samples. LS version has transmission aperture.

SIMILAR PRODUCTS

	HCS321Gi	TS102S	TS102VXY	TSA12Gi
				
Temperature Range	-190°C to 250°C	-25°C to 120°C	- 40°C to 120°C	-25°C to 120°C
Atmospheric Control	✓		✓	✓
Sample Area	23mm x 28mm	45mm x 45mm (Groove for 25mm x 75mm slides)	40mm x 40mm	Ø40mm/ 25mm x 75mm
Sample Cooling	LN2	TEC	TEC	TEC
Thermal Block	Aluminum	Aluminum	Aluminum	Aluminum
Designed for Inverted Microscopy	✓	✓		✓

Other products to consider....



HCS621GXY heating and cooling stage with 28mm x 28mm sample area. Temperature range -190°C to 600°C. Gas-tight chamber with gas purge capabilities. Includes XY positioning and option to add electrical feedthroughs. Offers increased temperature range versus TS102Si, and also supports atmospheric control, but is not specialized for inverted microscopy.



CLM77Ki Inverted Cryo-light and Cryo-electron microscopy stage with 3x3 EM sample grid. Temperature range -190°C to 150°C. 2mm transmission aperture, CWD=19.3mm OWD= 5.0mm. Usable for Inverted microscopy, but has strict requirements on sample sizes and loading.



HCS302/ HCS302XY heating and cooling stage for general-purpose upright microscopy. Temperature range -190°C to 400°C, requires LN2 for sample cooling. Fits standard 25mm to 75mm microscope slides. Optional XY sample positioner kit. Offers increased temperature range over TS102Si, but is not specialized for inverted microscopy.

CONTACT A REPRESENTATIVE 